

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A recombinant porcine adenovirus capable of expressing DNA of interest, said DNA of interest being stably integrated into an appropriate site of said recombinant porcine adenovirus genome.

2. A recombinant vector including a recombinant porcine adenovirus stably incorporating, and capable of expressing DNA of interest.

~~3. A recombinant vector as claimed in claim 2 wherein said recombinant porcine adenovirus is capable of expression of at least one heterologous nucleotide sequence.~~

Claim 2
4. A recombinant vector as claimed in ~~claims 2 or 3~~ wherein said recombinant porcine adenovirus includes a live porcine adenovirus having virion structural proteins unchanged from those in a native porcine adenovirus from which said recombinant porcine adenovirus is derived.

Claim 3
~~5. A recombinant vector as claimed in claims 3 or 4 wherein said at least one heterologous nucleotide sequence is capable of expression as an antigenic polypeptide.~~

Claim 3
6. A recombinant vector as claimed in ~~claims 3 or 4~~ wherein said at least one heterologous nucleotide sequence is capable of expression as an immuno-potentiating molecule.

7. A recombinant vector as claimed in claim 5 wherein said heterologous nucleotide sequence encodes antigenic determinants of infectious agents causing intestinal diseases in pigs.

8. A recombinant vector as claimed in claim 5 wherein said heterologous nucleotide sequence encodes antigenic determinants of infectious agents causing respiratory diseases in pigs.

9. A recombinant vector as claimed in claim 5 where said heterologous sequence encodes an antigenic determinant of pseudorabies virus (Aujeszky's disease virus).

10. A recombinant vector as claimed in claim 9 where heterologous sequence encodes an antigenic determinant of glycoprotein D of pseudorabies virus.

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11. A recombinant vector as claimed in claim 5 where said heterologous sequence encodes an antigenic determinant of porcine respiratory and reproductive syndrome virus (PRRSV).

12. A recombinant vector as claimed in claim 5 wherein said heterologous nucleotide sequence encodes an antigenic determinant of Hog cholera virus.

13. A recombinant vector as claimed in claim 5 wherein said heterologous nucleotide sequence encodes an antigenic determinant of porcine parvovirus.

14. A recombinant vector as claimed in claim 5 wherein said heterologous nucleotide sequence encodes an antigenic determinant of porcine coronavirus.

15. A recombinant vector as claimed in claim 5 wherein said heterologous nucleotide sequence encodes an antigenic determinant of porcine rotavirus.

16. A recombinant vector as claimed in claim 5 wherein said heterologous nucleotide sequence encodes an antigenic determinant of porcine parainfluenza virus.

17. A recombinant vector as claimed in claim 5 wherein said heterologous nucleotide sequence encodes an antigenic determinant of Mycoplasma hyopneumonia.

18. A recombinant vector as claimed in claim 6 wherein said heterologous nucleotide sequence encodes FLT-3 ligand.

19. A recombinant vector as claimed in claim 6 wherein said heterologous nucleotide sequence encodes interleukin 3 (IL-3).

20. A recombinant vector as claimed in claim 6 wherein said heterologous nucleotide sequence encodes porcine interleukin 4 (IL4).

21. A recombinant vector as claimed in claim 6 wherein said heterologous nucleotide sequence encodes gamma interferon (γ IFN).

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~~22. A recombinant vector as claimed in claim 6 wherein said heterologous nucleotide sequence encodes porcine granulocyte macrophage colony stimulating factor (GM-CSF).~~

~~23. A recombinant vector as claimed in claim 6 wherein said heterologous nucleotide sequence encodes porcine granulocyte colony stimulating factor (G-CSF).~~

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~~24. A recombinant vector as claimed in *claim 3* ~~claims 3 or 4~~ wherein said heterologous nucleotide sequence encodes an antigenic polypeptide and an immuno-potentiating molecule.~~

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~~25. A recombinant vector as claimed in *claim 2* ~~any one of claims 2 to 24~~ wherein said recombinant porcine adenovirus is selected from the group consisting of serotypes 3 and 4.~~

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~~26. A recombinant vector as claimed in *claim 2* ~~any one of claims 2 to 25~~ wherein DNA of interest is stably integrated into the non-essential regions of the porcine adenovirus genome.~~

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~~27. A recombinant vector as claimed in *claim 2* ~~any one of claims 2 to 26~~ wherein DNA of interest is stably integrated into the right hand end of the genome.~~

~~28. A recombinant vector as claimed in claim 27 wherein DNA of interest is stably integrated into the right hand end of the genome at map units 97 to 99.5.~~

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~~29. A recombinant vector as claimed in *claim 2* ~~any one of claims 2 to 26~~ wherein DNA of interest is stably integrated into the E3 region of the genome.~~

~~30. A recombinant vector as claimed in claim 29 wherein DNA of interest is stably integrated into the E3 region of the genome at map units 81-84.~~

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~~31. A method of producing a recombinant porcine adenovirus vector for use as a vaccine including inserting into a non-essential region of an porcine adenovirus genome, at least one heterologous nucleotide sequence in association with an effective promoter sequence.~~

~~32. A method as claimed in claim 31 wherein prior to insertion of said heterologous nucleotide sequence, a restriction enzyme site is inserted into said non-essential region of said porcine adenovirus genome.~~

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~~33. A recombinant vaccine for generating and/or optimising antibodies or cell mediated immunity so as to provide or enhance protection against infection by an infectious organism in pigs, said vaccine including at least one recombinant porcine adenovirus vector stably incorporating, and capable of expression of at least one heterologous nucleotide sequence, and suitable carriers and/or excipients.~~

34. A recombinant vaccine as claimed in claim 33 wherein the said at least one heterologous nucleotide sequence is capable of expression as an antigenic polypeptide.

35. A recombinant vaccine as claimed in claim 33 wherein said at least one heterologous nucleotide sequence is capable of expression as an immuno-potentiating molecule.

36. A recombinant vaccine as claimed in claim 33 wherein said heterologous nucleotide sequence encodes an antigenic polypeptide and an immuno-potentiating molecule.

Claim 33
~~37. A recombinant vaccine as claimed in any one of claims 33 to 36 wherein said carriers and/or excipients are selected such that said vaccine is deliverable in the form of an aerosol spray, an enteric coated dosage unit or an inoculum.~~

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Claim 33
~~38. A method of producing a recombinant vaccine as claimed in any one of claims 33 to 36 including admixing at least one recombinant porcine adenovirus vector stably incorporating, and capable of expression of at least one heterologous nucleotide sequence together with suitable carriers and/or excipients.~~

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~~39. A method of vaccination of pigs against disease including administering to said pigs a first recombinant porcine adenovirus vector stably incorporating, and capable of expression of at least one heterologous nucleotide sequence encoding an antigenic determinant of said disease against which vaccination is desired.~~

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40. A method as claimed in claim 39 including administering to said pig a second porcine adenovirus vector including at least one heterologous nucleotide sequence which differs from said at least one heterologous nucleotide sequence incorporated in said first recombinant porcine adenovirus vector.

41. A method as claimed in claim 40 wherein said second porcine adenovirus vector comprises a serotype different to that of said first porcine adenovirus vector.

42. A method as claimed in claim 39 wherein said second porcine adenovirus vector incorporates, and is capable of expression of at least one heterologous nucleotide sequence encoding an immunopotentiating molecule.

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